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**From:** Doug Krapas [dougkrapas@iepc.com]  
**Sent:** 11/30/2017 11:20:41 PM  
**To:** 'Baldwin, Karin K. (ECY)' (KBAL461@ECY.WA.GOV) [KBAL461@ECY.WA.GOV]; 'Greenlund, Doug' [dgreenlund@spokanecity.org]; 'Mike Petersen' [mpetersen@landscouncil.org]; 'Vikki Barthels' [vbarthels@srhd.org]; 'VanBergen, Saskia (ECY)' [sava461@ECY.WA.GOV]; 'Whitman, Kara Michelle' [kmwhitman@wsu.edu]; Lisa Dally Wilson [Ex. 6 Personal Privacy (PP)]; 'keith.kawamura@des.wa.gov' [keith.kawamura@des.wa.gov]; 'lahtig@wsdot.wa.gov' [lahtig@wsdot.wa.gov]; Lindsay, Robert (RLindsay@spokanecounty.org) [RLindsay@spokanecounty.org]; Mullin, Michelle [Mullin.Michelle@epa.gov]; Edmondson, Lucy [Edmondson.Lucy@epa.gov]; Olsen, Catherine [colsen@spokanecity.org]; ABOR461@ECY.WA.GOV; 'Pond, Elsa' [PondE@wsdot.wa.gov]  
**CC:** Edmondson, Lucy [Edmondson.Lucy@epa.gov]; Olsen, Catherine [colsen@spokanecity.org]; ABOR461@ECY.WA.GOV; David Newton [DavidNewton@iepc.com]  
**Subject:** FW: Pigments in roadmarking  
**Attachments:** Diarylide-Free Yellow NTPEP and Fence Data 112217.xlsx

Some additional information for our meeting tomorrow based on my conversations with SWARCO today. It will be important for the DOT, City and County to weigh in on this.

Chat with many of you tomorrow at 10:00.

Doug

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**From:** Jung, Michael [mailto:michael.jung@swarco.com]  
**Sent:** Thursday, November 30, 2017 2:49 PM  
**To:** Doug Krapas  
**Cc:** Mahaffey, Robbie  
**Subject:** RE: Pigments in roadmarking

Hi Doug,

It was nice talking to you today about the diarylide-free yellow portion of your PCB reduction project. Thanks for taking the time to discuss the issues with us.

I have just a few bullet points regarding the chart data that we discussed:

- We currently have 18 months Florida test deck data using our diarylide-free pigment system. (Orange line on the attached chart.)
- The exposure fence is a harsher test (yellow line) than the Florida test deck because the sunlight is more direct.
- The initial color on the fence is better because that sample is standard thermoplastic; the Florida test deck is a preformed thermoplastic product. The pigmentation is the same, just a couple resins are different.
- We can formulate a product for Washington using the same diarylide-free yellow pigment that will have a better initial color than what is shown in the attached chart.
- The Florida test deck and our exposure fence are both much harsher test conditions than what a product would experience in Washington State.
- Diarylide-free yellow products should be able to pass (and should be required to pass) the ASTM yellow color box on the road in Washington State.
- Existing official test deck data should be an acceptable substitute for a Washington State test deck as long as it is clearly harsher than what would be experienced in Washington State.
- Some diarylide-free yellow pigments have very poor exposure performance so all new systems should be qualified on a test deck before being deemed acceptable.

- We have a test deck-proven diarylide-free yellow thermoplastic product that is ready today for sale in the State of Washington

We look forward to working with you to reduce PCBs in the environment. Please let me know if you have any questions. I'll be happy to discuss this information further with the DOT and other personnel on the task group.

Best regards

**Michael Jung**  
Thermoplastic Division Manager

**SWARCO INDUSTRIES LLC**  
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**From:** Jung, Michael  
**Sent:** Wednesday, November 22, 2017 12:47 PM  
**To:** 'Doug Krapas' <[dougkrapas@iepc.com](mailto:dougkrapas@iepc.com)>  
**Subject:** RE: Pigments in roadmarking

Hi Doug,

Thank you for adding us to the meeting agenda. I would certainly like to talk to you prior to the meeting to provide more information and answer any questions you may have. The attached file shows the color data for our diarylide-free yellow thermoplastic that has been on the Florida test deck since October 2015 as well as the sample on our exposure fence. I think the sooner we can arrange a trial and send a sample for WADOT independent analysis, the better. Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP) so please call me on Wednesday or Thursday next week.

Have a Happy Thanksgiving!

Best regards

**Michael Jung**  
Thermoplastic Division Manager

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**From:** Doug Krapas [<mailto:dougkrapas@iepc.com>]  
**Sent:** Tuesday, November 21, 2017 5:45 PM  
**To:** Jung, Michael <[michael.jung@swarco.com](mailto:michael.jung@swarco.com)>  
**Subject:** RE: Pigments in roadmarking

Hello Michael and thank you for responding so quickly. I have taken on a leadership role on the TSCA/PCB concerns and am currently managing the PCB in road paints pilot/WA Purchasing Policy discussions. I have a meeting scheduled at the end of next week (Friday, December 1) with representatives of the work group that I have assembled for this effort and have put your offer on the agenda for discussion. I imagine that we will want to engage with you in a subsequent discussion to obtain more information, and will get back to you at that time.

If you feel it would be of benefit for the two of us to talk prior to that meeting, please let me know so we can arrange for a call. Otherwise, I will talk to you after the 1<sup>st</sup>.

Have a great Thanksgiving.

Doug

**Doug Krapas**  
Environmental Manager



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**From:** Jung, Michael [<mailto:michael.jung@swarco.com>]  
**Sent:** Monday, November 20, 2017 2:12 PM  
**To:** Doug Krapas  
**Subject:** RE: Pigments in roadmarking

Hi Doug,

I received your email from Mark Vincent. I had heard that the State of Washington was looking into eliminating diarylide pigments in their thermoplastic pavement markings in order to reduce PCB's in the environment. We happen to have a diarylide-free pigment system that we have been using with great success for the last few years. I would love to have the opportunity to discuss it with you and whomever else at WADOT would be interested. Please email me or call when you get a chance. My office number is below, or feel free to call me on my cell at 931-623-4293.

Best regards

**Michael Jung**  
Thermoplastic Division Manager

**SWARCO INDUSTRIES LLC**

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**From:** Mark Vincent [<mailto:MarkVincent@dominioncolour.com>]  
**Sent:** Sunday, November 19, 2017 10:25 AM  
**To:** Doug Krapas [[dougkrapas@iepc.com](mailto:dougkrapas@iepc.com)] <[dougkrapas@iepc.com](mailto:dougkrapas@iepc.com)>  
**Cc:** Jung, Michael <[michael.jung@swarco.com](mailto:michael.jung@swarco.com)>  
**Subject:** Pigments in roadmarking

Dear Doug

It was a pleasure to talk to you on Friday. Thankyou for getting back to me.

As discussed on the phone I have been talking to a company called Swarco who happens to be ahead in terms of developing diarylide free roadmarkings with much lower PCB content but also meeting the required colour and performance characteristics.

As promised, I have copied Michael Jung, the Division Manager of the Thermoplastic Division at Swarco who would very much like to discuss this topic with you and to introduce him to the task force in order to give his input.

Thanks and regards

Mark

**MARK VINCENT**  
**CEO**  
**Dominion Colour Corporation**

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